Exterior Wall Finish

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Introduction

Purpose:

This unit prepares students to apply various types of siding, the application process, and estimating for residential dwelling units.

Core Objective:

Upon completion of this unit students will demonstrate the ability to identify various types of siding. The students will estimate materials for, create a shed plane, apply flashing, and apply siding to wall sections that would meet the minimum CABO one and two family dwelling unit in the builders code book standards. Students will demonstrate this knowledge with performance activities such as, applying tyvek or typar, calculation of materials, and creating a story pole. This culminating activity, that consists of individual students, applying various types of siding to comply with the code, and assess student knowledge

Objectives:

703 Identify and define different types and styles of siding for wood structures.
704 Establish applicable codes.
705 Identify types of siding (Bevel, T&G, Shiplap, Sheet, Clapboards, and Vinyl).
706 Calculate square footage.
707 Identify profiles of each siding material.
708 Layout a story pole.
709 Estimate materials as per plan.
710 Application methods of a shed plane and flashing.
711 Utilize methods of fastening.
712 Flash, apply a shed plane, and apply siding material to a wall section to be code compliant.

Estimated Time:

Six contact hours for theory.
Six hours of assessment.

Standards

This core learning experience addresses the following standards:

Industry Standards:
CABO

703.1 Wood shakes and shingles
- 703.1.1 Attachment
- 703.1.2 Furring
- 703.1.3 Bottom Course

703.2 General
703.3 Weather- Resistant Sheathing
- 703.3.1 Felt or material

703.4 Wood, Plywood and Wood structural panel siding
- 703.4.1 Horizontal siding

703.5 Attachments
703.6 Wood shakes and shingles
- 703.6.1 Application
- 703.6.2 Weather exposure
- 703.6.3 Attachment
  - 703.6.3.1 Staple attachment

703.7 Exterior Lathe
703.8 Flashing

New Standards Performance Standards:

E1. Reading

E1c. The student reads and comprehends informational materials to develop understanding and expertise and produces written or oral work that:

- **Restates or summarizes information;**
- **Relates new information to prior knowledge and experience;**
- **Extends ideas;**
- **Makes connections to related topics or information.**

E4b. The student analyzes and subsequently revises work to clarify it or make it more effective in communicating the intended message of thought. The student's revisions should be made in light of purposes, audiences, and contexts that apply to the work. Strategies for revising include:

- Adding or deleting details;

- Adding or deleting explanations;
- **Clarifying difficult passages;**
- **Rearranging words, sentences, and paragraphs to improve or clarify meaning;**
- **Sharpening the focus;**
- **Reconsidering the organizational structure;**
- Rethinking and/or rewriting the piece in light of different audiences and purposes.

E2. Writing

E2a. The student produces a report that:

- engages the reader by establishing a context, creating a persona, and otherwise developing reader interest;
- develops a controlling idea that conveys a perspective on the subject;
- creates an organizing structure appropriate to purpose, audience, and context;
- **includes appropriate facts and details;**
- **excludes extraneous and inappropriate information;**
- **uses a range of appropriate strategies, such as providing facts and details, describing or analyzing the subject, narrating a relevant anecdote, comparing and contrasting, naming, explaining benefits or limitations, demonstrating claims or assertions, and providing a scenario to illustrate;**
- provides a sense of closure to the writing.

E3b. The student participates in group meetings, in which the student:

- displays appropriate turn-taking behaviors;
- actively solicits another person's comment or opinion;
- offers own opinion forcefully without dominating;
- **responds appropriately to comments and questions;**
- **volunteers contributions and responds when directly solicited by teacher or discussion leader;**
- **gives reasons in support of opinions expressed;**
- **clarifies, illustrates, or expands on a response when asked to do so; asks classmates for similar expansions;**
- **employs a group decision-making technique such as brainstorming or a problem-solving sequence (e.g., recognize problem, define problem, identify possible solutions, select optimal solution, implement solution, evaluate solution);**
- divides labor so as to achieve the overall group goal efficiently.

E3c. The student prepares and delivers an individual presentation in which the student:

- shapes information to achieve a particular purpose and to appeal to the interests and background knowledge of audience members;
- **shapes content and organization according to criteria for importance and impact rather than according to availability of information in resource materials;**
- uses notes or other memory aids to structure the presentation;
- **develops several main points relating to a single thesis;**
- engages the audience with appropriate verbal cues and eye contact
- projects a sense of individuality and personality in selection and organizing content, and in delivery.

M1. Number and operation concepts

M1a. Uses addition, subtraction, multiplication, division, and exponentiation in forming and working with numerical or algebraic expressions (the statement has been modified).

M1g. Carries out proportional reasoning in cases involving part-whole relationships and in cases involving expansions and contractions.

M2. Geometry and Measurement Concepts

M2a. Models situations geometrically to formulate and solve problems.
M2d. Visualizes objects, paths, and regions in space, including intersections and cross sections of three dimensional figures, and describes these using geometric language.
M2k. Works with geometric measures of length, area, volume, and angle; and non-geometric measures such as weight and time.
M2n. Solves problems involving scale, such as in maps and diagrams.

M6. Mathematical Skills and Tools

The student demonstrates fluency with basic and important skills by using these skills accurately and automatically, and demonstrates practical competence and persistence with other skills by using them effectively to accomplish a task, perhaps referring to notes, or books, perhaps working to reconstruct a method; that is, the student:

M6a. Carries out numerical calculations and symbol manipulations effectively, using mental computations, pencil and paper, or other technological aids, as appropriate.
M6b. Uses a variety of methods to estimate the values, in appropriate units, have quantities met applications, and rounds numbers used in applications to an appropriate degree of accuracy.
M6c. Evaluates and analyzes formulas and functions of many kinds, using both pencil and paper and more advanced technology.
M6d. Uses basic geometric terminology accurately, and deduces information about basic geometric figures in solving problems.
M6l. Uses tools such as rulers, tapes, compasses, and protractors in solving problems.
M6m. Knows standard methods to solve basic problems and uses these methods in approaching more complex problems.

A2. Communication Tools and Technologies

A2a. The student makes an oral presentation of project plans or findings to an audience with expertise in the relevant subject matter; that is, the student:

- **organizes the presentation in a logical way appropriate to its purpose;**
- **adjusts the style of presentation to suit its purpose and audience;**
- speaks clearly and presents confidently;
- **responds appropriately to questions from the audience;**
- **evaluates the effectiveness of the presentation and identifies appropriate revisions for a future presentation.**

A2b. The student prepares a formal written proposal or report to an organization beyond the school; that is, the student:

- **organizes the information in the proposal or report in a logical way appropriate to its purpose;**
- produces the proposal or report in a format similar to that used in professionally produced documents for a similar purpose and audience.

A3. Information Tools and Technologies

A3a. The student gathers information to assist in completing project work; that is, the student:

- identifies potential sources of information to assist in completing the project;
- uses appropriate techniques to collect the information, e.g., considers sampling issues in conducting a survey;
- **interprets and analyzes the information**

- **evaluates the information in terms of completeness, relevance, and validity;**
- shows evidence of research in the completed project.

ITEA Standards:

Rubric

Scale Criteria	Needs to work substantively in this area in order to meet the standard 1	Shows progress toward the standard 2	Meets the standard 3	Exceeds the standard 4
Lesson 1	Student is unable to create a scale drawing. Student is unable to research applicable codes. Drawing does not include architectural symbols.	50 % of the drawing is to scale. 50 % of applicable codes listed. 50 % use of applicable architectural symbols.	100 % of the drawing is to scale. 100 % of applicable codes listed. 100 % use of applicable architectural symbols.	100 % of the drawing is to scale. 100 % of applicable codes listed. 100 % use of applicable architectural symbols. Discuss material and methods of siding application
Lesson 2	Student is unable to interpret scale drawings. Student is unable to calculate square footage. Student is unable to calculate materials.	Student is able to interpret 50% of the scale drawings. Student is able to calculate 50% of the square footage. Student is able to calculate 50% of the materials.	Student is able to interpret scale 100% drawings. Student is able to calculate 100% of the square footage. Student is able to calculate 100% of the materials.	Student is able to interpret scale 100% drawings. Student is able to calculate 100% of the square footage. Student is able to calculate 100% of the materials. Student applies learned formulas to more complex drawings and shapes.
Core Assessment	Siding is not level. Siding is not properly nailed. Improper nail size and type were used. No flashing installed. Student did not create a story pole.	Six of ten pieces of siding are level. Six of ten pieces of siding is nailed properly. Improper nail size and type were used. Some flashing installed. Student created an inaccurate story pole.	Eight of ten pieces of siding are level. Eight of ten pieces of siding is nailed into studs. All nails are the appropriate size. All flashing is installed. Student created an accurate story pole.	All siding is level. All siding is properly nailed into studs. Course exposure varies less than ¼". Flashing is installed properly.

Core Learning Experience Summary Chart

Student Tasks & Instructional Methodology for Each Learning Experience		
Student Learning Experiences	**Student Tasks**	**Instructional Methodologies**
Learning Experience I	Draw and define types of siding using Architectural symbols Draw using scale Illustrate different codes for different sidings Present findings to class for discussion	Lecture Research at home Research and use of code book Research and use of Architectural Symbols
Learning Experience II	Use a variety of formulas to calculate area Use a variety of formulas to calculate waste by percentage Use scale drawings to acquire dimensions Measure calculate and estimate materials	Lecture Applied learning Research and use of code book Use of Architectural notation and symbols
Integrative/Review Experience	Create and explain the function of a shed plane. Apply and explain the use of flashing Apply siding according to building code	Lecture Applied learning Educational Resource

Description of Core Assessment: performance
The students will read Architectural notation and symbols for siding. The student will create and explain the function of a shed plane. The students will demonstrate the ability to use the code book. The students shall apply siding according to current building code.

Student Learning Experience 1

Purpose: Students will identify various types of siding.
Students will draw appropriate scale representations of the siding.
Students will identify applicable building codes related to specific siding.

Estimated Time: 2 hours

Standards: A2a, A2b, A3a, E1c, E2, E3b, E3c, M1g, M2d, M6l
CABO: Section Seven

Key Concepts Addressed:

a. Glossary of terms
b. Scale
c. Architectural siding symbols
d. Applicable siding codes

Student Tasks:

a. The students will complete a scale drawing of the front of their home.
b. The drawing shall include all appropriate siding, window and door symbols and dimensions.
c. The student shall research and present to the class all applicable building codes for the siding on their home.

Explanation of how learning tasks require higher-level thinking:

Students must conduct research to find appropriate Architectural symbols for the siding on their home and apply them in a scale drawing. The students must conduct research to find applicable building codes that apply for one type of siding and present them to the class.
Students learn about different sidings and the codes that apply to them.
Student learn where and how to research building codes and architectural symbols.

Teacher Responsibilities:

Give students the assignment with the requirements and the rubric for the project. Provide students with drawing materials, access to a copy of the current CABO codebook and Modern Carpentry (or equivalent) with Architectural Siding Symbols.

Materials & Equipment: Paper, architectural ruler, drafting table, tape measure

Resources: Modern Carpentry, CABO code book

Student Learning Experience 2

Purpose: Students will measure, calculate square footage, and estimate materials needed for a siding application including waste.

Estimated Time: 2 hours

Standards: E2a, M1a, M1g, M2n, M6a, M6b, M6c, M6d, M6l, M6m
CABO: Section seven

Key Concepts Addressed:

a. Glossary of terms
b. Application of mathematic formulas for calculation of area
c. Application of percentages for calculating waste
d. Code requirements for different sidings

Student Tasks:

a. Measure walls
b. Calculate square footage (Area)
c. Calculate by use of percentages for waste
d. Produce an accurate material estimate (dependant on choice of siding)

Explanation of how learning tasks require higher-level thinking:

a. Students will use mathematic formulas to measure, calculate square footage and waste.
b. Students develop a material list for a specific type of siding.
c. Students will research any relevant building code
d. Students will compare material differences for different sidings.
e. Work with drawings and scale

Teacher Responsibilities:

a. Provide scale elevation drawing to each student
b. Assign a siding type to each student
c. Provide time and access to CABO code book
d. Provide rubric

Materials & Equipment:

Tape measure, handouts and calculator

Resources: CABO code book, Modern Carpentry text

Complete Core Assessment

Purpose: Application of siding materials

Estimated Time: 12 hours

Standards: M1a, M1g, M2n, M6a, M6b, M6l, M6m

Key Concepts Addressed:

a. Concepts from learning experiences one and two
b. Learning to properly apply siding to meet building code
c. Creating a shed plane
d. Glossary of terms

Student Tasks:

a. Create a story pole
b. Create a shed plane
c. Apply any necessary flashing
d. Apply siding material according to building code

Explanation of how learning tasks require higher-level thinking:

Students will use mathematic formulas to divide and lay out siding courses and to be equal.
Students will create a shed plane to carry water down each course of siding.

Teacher Responsibilities:

Instructor guides the students through application of the various types of siding.

Materials & Equipment:

Wall unit from Exterior Wall construction, miter saw, hammer, nails, siding material, tyvek or builders paper, furring, casing for window opening, flashing.

Resources:

Modern Carpentry**,** CABO code book

Disclaimer

The focus of this unit assumes prior knowledge of:

a. Safety-equipment and job site
b. Safety-training of all hand and power tools.
c. Leveling-reading of.
d. Estimating-basic math computations.
e. Measuring- measure accurately.
f. Blueprints-reading and understanding.
g. Layouts-methods of.